Neal Ferris
451 Tecumseh Street East
London, Ontario
N6C 1T6

life

ISSN 0228-4111

NEWSLETTER OF THE LONDON CHAPTER,
ONTARIO ARCHAEOLOGICAL SOCIETY
55 Centre St., London, Ontario N6J 1T4
(519) 675-7742; Fax: 675-7777

April 2001

01-4

******

WELCOME BACK!

The first Speaker of the fall session is Dr. Peter Sheppard, of the Department of Anthropology, University of Auckland, New Zealand. His topic is ***"Roviana: The Archaeology of a Melanesian Lagoon, Solomon Islands"***. Come and join us Thursday September 13th at the museum.

******

As always, our meeting will be held at 8 pm at the London Museum of Archaeology, 1600 Attawandaron Road, near the corner of Wonderland & Fanshawe Park Road, in the northwest part of the city.

Chapter Executive

ANNUAL RATES

Individual	$18.00
Student	$15.00
Institutional	$21.00
Subscriber	$20.00

Long House Widths and the Pickering Conquest Hypothesis

James R. Keron July, 2001

"I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories instead of theories to suit facts. "Sherlock Holmes to Dr. Watson.
Arthur Conan Doyle: A Scandal in Bohemia

INTRODUCTION

The conquest hypothesis was originally proposed by J. V. Wright in his synthetic work, *The Ontario Iroquois Tradition* (1966), to explain widespread similarities that he identified in the Middle Ontario Iroquois Stage. He divided the Ontario Iroquois Tradition into three stages, early, middle and late. The Early Ontario Iroquois stage was composed of two branches, Pickering and Glen Meyer. The former was located in south-central Ontario while the latter occupied south-western Ontario. The termination of the Early Ontario Iroquois Stage is marked by the conquest of the Glen Meyer Branch by the Pickering Branch and the unbroken development of the Pickering Branch to create a cultural horizon across the southern portion of the province called the Uren Substage of the Middle Ontario Iroquois Stage. The evidence behind this hypothesis was further developed in the report on the Bennett Site (Wright and Anderson, 1968) where comparisons between Bennett, a late Pickering Site, Goessens, a late Glen Meyer Site and the Uren Site indicated that Uren has a closer affinity to Bennett than to Goessens. Over the intervening years most archaeologists have either rejected the idea or at least treated it with a high degree of scepticism (Fox 1976, Sutherland 1980, Trigger 1985; White 1971; Williamson 1990; M. Wright 1986; etc.). There has been limited acceptance (Finlayson 1998; Finlayson et al 1989; Kapches 1982; Pearce 1996) although this has been characterized by some changing opinion. For example, Kapches (1982) accepts the idea but later (1994) rejects it. Recently, J. V. Wright (1990, 1992, 1994) has strongly re-asserted his continuing belief in the conquest theory, claiming that the archaeology in the succeeding years has only strengthened it as the sole possible explanation for the observed changes. New data are reviewed in the 1992 paper. He has also noted on several occasions (Wright 1982, 1990, 1994) the failure of detractors to deal with the data [with the exception of M Wright (1986) and M. Spence (1994)] and to propose other explanations. However, it would seem from the literature that several alternative explanations have been proposed varying from simple acceptance of cultural continuity with the implied assumption that diffusion accounts for the differences (Sutherland 1980; Trigger 1985; M. Wright 1986) to more elaborate attempts to explain the manner of the diffusion through regional interaction (Timmins 1997; Williamson and Robertson, 1994) and even Mississipian influence (Dincauze and Hasentab 1989; S. Jamieson 1991, 1992). Finally, one other unusual explanation based on Chaos Theory has been provided (Kapches 1994) which might be best termed a variant on regional interaction model. Other than rejecting one uncited explanation as being more chaos than theory, Wright has not dealt with any of these explanations other than by asserting that no explanation other than conquest accounts for the changes (Wright 1990:498).

In his 1992 paper, Wright identifies three primary types of data which indicate a conquest (technology, settlement patterns and burial data), arguing that all three of these indicate a continuity from Pickering to Uren and a discontinuity between Glen Meyer and Uren. Thus the only explanation for these observations is cultural replacement rather than diffusion or cultural change. Spence (1994) reviewed all available early Ontario burial data and mortuary programs. The intention of this paper is to re-examine Wright's use of settlement pattern data, in particular his use of house width. It is also the intention here to try to approach the issue objectively and consider the data on it's own merits in the spirit of the challenge which Wright has issued, to determine in what matter it supports or contradicts the conquest hypothesis. One minor note on terminology is that this paper will use the term "hypothesis" rather than "theory" to describe the conquest explanation as Wright (1992) proposed in keeping with Sherlock Holmes admonition to not move too quickly to theories.

While Wright (1992) states that Pickering settlement patterns are more similar to Uren patterns and both are dissimilar to Glen Meyer patterns, other than simple assertion the only attempt to deal with the data is an analysis of long house widths. Wright (1992) analyzed a good deal of the published data on longhouse widths and lengths concluding that, while Pickering houses are on the average longer than Glen Meyer, "the most significant difference between the houses of these two cultures is their widths" (1992:5). He notes that most Glen Meyer houses are under 6.5 metres in width while most Pickering houses are over 6.5 metres, however, there was no attempt to demonstrate that this observation was statistically significant. This conclusion seems at odds with Dodd (1984: 289) who concluded, with the use of statistical procedures, that there was no statistically significant difference between Pickering and Glen Meyer houses. The only new data which Wright used were the preliminary site maps from the Elliot Site (Fox, 1986a, 1986b) and he confined his analysis to maximum width measurements. The intent of this paper is to take a look at the data on long house sizes in an objective manner from several perspectives using statistics to see in what manner they do or do not support the conquest hypothesis.

Before moving to the data itself, some discussion of the nature of the Glen Meyer, Pickering and Uren constructs is required in order to orient the analysis.

WHAT'S IN A NAME: "PICKERING", "GLEN MEYER" AND "UREN"

Wright (1992:5) notes that one of the factors on which proof of the conquest hinges, as it relates to settlement patterns, are the "preconquest sites distributions" of Pickering and Glen Meyer. While it is doubtful that anyone would dispute the contemporaneous presence of Early Ontario Iroquoians in south-central and south-western Ontario, there is an implicit assumption in this statement that demands consideration, namely the meaning and connotations surrounding the Pickering and Glen Meyer constructs since the use of these terms tends to assume a political reality which is a fundamental precondition for a conquest to take place. Questions which need to be answered are "would the Pickering and Glen Meyer constructs have had any meaning to the Early Ontario Iroquoians?" and "did the people of south-central Ontario have the necessary sociocultural integration and central political control to actually carry out a conquest and occupation of south-western Ontario?"

Before addressing these questions, it is first necessary to consider the theoretical foundation of the Ontario Iroquois Tradition (Wright, 1966) and the conquest hypothesis that it proposes. The conquest hypothesis is rooted in the historical development of Iroquoian archaeology and the nature of the archaeological theory of thirty-five years ago. The intellectual development of Iroquoian archaeology has been documented elsewhere (Pearce 1996, Smith 1990, Timmins 1997) and will not be repeated here. However, there are two points which are relevant to the formulation of the Pickering and Glen Meyer constructs. First, the formulation was developed within the use of the direct-historic approach as originally applied to Iroquoian studies by MacNeish (1952) and also used by Wright (1966). The starting point was the observed historical cultures and the objective was to use this as an anchor point and then trace the development back through time to develop the prehistory of the group under consideration. While this has proven to be an efficacious theoretical approach especially in the late prehistoric period, to some extent it has led to an uncritical projection of the historic cultural complex back into time. Thus, the demonstration of palisaded village and long houses was often equated to the demonstration of the historic Iroquois culture pattern (Noble 1975b for example). Secondly, definition of archaeological cultures was based on similarities in artifactual data, limited numbers of sites, and a broad regional focus that stressed similarities. In a general sense it was conceptually rooted in the anthropological concept of "culture area". This perspective, combined with the direct historic approach, led to another assumption that the archaeological cultures so defined were equivalent to real cultures with an implicit assumption of political unity for the culture so defined. Thus, archaeological constructs such as Pickering, Glen Meyer and Uren tend to be equated to historical political entities such as Huron, Neutral or Iroquois. While alternate models of Iroquoian political development have been proposed (Timmins 1997;Williamson and Robertson 1994) and certainly, the socio-cultural integration within the early Ontario Iroquois stage had been questioned much earlier (Sutherland 1980). Wright (1992), in his recent defense of the conquest hypothesis, assumes the validity of the constructs and does not attempt to demonstrate the socio-cultural integration that would be required to carry out a conquest and occupation. In fact, the opposite occurs where the conquest is used as a proof of the achievement of a suitable level of socio-political integration (Wright 1990, 1992).

With concerns over the Pickering and Glen Meyer constructs recognized, what is emerging with more detailed regional studies, is the concept that there are a number of regional clusters that would seem to be the same community occupying the same territory through a significant time period (Pearce 1996, Williamson 1985, Timmins 1997). This pattern also exists in other Iroquoian societies such as the St Lawrence Iroquoians (B. Jamieson, 1990) and the Onondaga (Tuck 1971). Williamson and Robertson (1994) propose a model which should form the basis for research designs within Iroquoian studies. First, the broader existing categorizations such as Pickering or Uren are relegated to general descriptive terms if not rejected outright. The basic building block and theoretical approach is through the regional clusters which are viewed as distinct communities and deemed to be independent peer polities. While in one sense, this assumption is just as arbitrary as the classification into Pickering or Glen Meyer in that it assumes independence, it provides an indisputably solid starting point for various analyses in that comparisons between the regional sequences and their corresponding changes could be used to demonstrate political interaction and the spatial extent of the polity. Williamson and Robertson (1994) build one such analysis on this base that claims the Early Ontario Iroquoians were not integrated beyond the village level and the

Middle Ontario Iroquois Stage saw the first steps in building higher levels of integration with the mergers of early villages into larger entities. This integration proceeds in two more steps until we arrive at the full blown confederacies and tribal divisions in the historic period. The same conceptual starting point could also be used and indeed should be used in any proof of the conquest. Thus, the only really valid conquest proof should start with a series of regional sequences, for example, Caradoc/Oxbow/Byron, Dorchester, Norfolk, Crawford lake, Duffins Creek and Rice Lake, and first demonstrate political cohesiveness achieved within the Pickering Branch, and secondly clear disruption of the Glen Meyer Branch at the introduction of Uren with the proven Pickering polity.

The Uren Substage, as proposed by Wright, is yet another archaeological construct based on widespread similarities at the start of the 14th century. It is a similar conceptual entity to Pickering or Glen Meyer. After Wright's initial definition of the Uren Substage, some opposition developed most likely owing to incredulity over the conquest hypothesis. Noble (1975a) suggested that the term be held in abeyance owing to questions over nature of the type site itself. He quotes Bill Fox in a personal communication suggesting that the Uren site was multi- component. The term was generally avoided subsequently by labeling all middle Ontario Iroquois material as Middleport (e.g. Pearce 1996, Timmins 1985). In his report on the Uren site, M. Wright (1986) disproved the multi-component nature of the site but, based on the fact that the new sample shows more Glen Meyer similarities than Wintemberg's artefact sample and that the new sample is more representative of the site (Wintemberg's sample came from one area that showed a higher percentage of "Pickering" traits), concludes that continuity with Glen Meyer was the most likely explanation and that the use of the Uren Substage as a Pickering conquest derivative should be abandoned. More recently, Dodd et al (1990) suggest that the Uren Substage is a valid construct although they carefully avoid an endorsement of the conquest hypothesis. Similar to Dodd et al (1990), this paper will retain the use of the term Uren Substage as an archaeological construct that describes province-wide similarities in the 14th century or the start of the Middle Ontario Iroquois Stage. Use of the term here does not imply endorsement of the conquest hypothesis or a pan-Ontario Iroquoian political entity that would have existed following the conquest.

Another important consideration is the nature and data behind the proof of the conquest hypothesis. The initial proposal of this (Wright 1966) was primarily developed on ceramic data plus several key index artefacts (ceramic gaming discs, modified deer phalanges). In 1968 (Wright and Anderson 1968), a more detailed proof is developed through detailed comparisons of three key sites: Bennett, Goessens and Uren. Wright again uses the same approach in his 1992 paper, but uses the data from M. Wright's (1986) recent excavations of the Uren site rather than the National Museums collection. These data are analyzed using coefficients of similarity to show that Uren is more similar to the late Pickering Bennett site than to the late Glen Meyer Goessens site. Use of only three sites for this demonstration significantly weakens the argument and Wright himself recognizes (1992) this fact but only refers readers to several site reports. This use of three sites is questionable on several grounds. First, there is again the assumption that both Pickering and Glen Meyer are valid constructs as discussed above. However even if they are, there is yet another question as to the representativeness of the three sites. There is the question of whether Bennett is representative of Pickering. Using Wright's (1966: 154) coefficients of similarity Bennett, is as almost as different from Boys as Boys is from Goessens. A second factor occurs through the use of coefficients of

similarity which are based on percentages of various attributes or types. Given the sudden popularity and equally sudden abandonment of the Iroquois Linear pottery type, selection of individual villages could easily distort the results depending on how late the Pickering representative is in the sequence. Thus, if Bennett is slightly closer to Uren in time than was Goessens, coefficients of similarity of ceramic data would lead to erroneous conclusions. The third aspect of the use of these coefficients of similarity and the relative percentages is that they are extremely sensitive to sampling error. The rim sherd category is well defined and has been so for a number of years. However, there remains the question of whether the sample is representative of the site in question. M. Wright (1986) has demonstrated that the original Uren sample was not representative of the site. The same can be said for bone and lithic artefacts where differences in these categories as shown in Wright's (1992) tables are more likely related to sampling, archaeological recognition and inter-observer error than to real differences between the sites involved.

LIES, DAMNED LIES AND STATISTICS

Before proceeding to analyze the data some discussion of the underlying statistical procedures would be in order. The question to be answered is fairly straight forward. Given the existing sample of long houses are the perceived differences in size, primarily as it relates to width, statistically significant and not the result of sampling error? The immediate question is Wright's (1992) assertion that Pickering is wider than Glen Meyer but more generally what other differences in long houses occur and how do they vary.

The first point to note is that for the statistical mathematics to work, the sample of long houses must be a random sample selected from the total population otherwise the results are questionable. It is doubtful that there is anyone in archaeology who would make the claim that the published list of Early and Middle Ontario Iroquoian houses is a randomly selected sample. Firstly, when a site is dug we tend to get multiple houses from the same site and the sample will be biased towards those sites with data for many houses. For example note the 20 plus houses from the Elliot site (Fox 1986a, 1986b). Secondly, not all of the existing information is readily available. Mitigation work is typically buried away in ministry reports which are not readily accessible as Wright notes (1992). Thirdly, excavated sites are not randomly selected across the province. Some areas have seen intensive research (e.g. Crawford Lake; Finlayson 1998) while others have been largely ignored for many years (e.g. Duffins Creek). While a number of other reasons could be brought up, the point is that any statements about the differences or even similarities will always be weakened by this aspect of the data and the conclusions will be suspect.

Nonetheless, we do need to probe the data for tendencies and regularities. Further, as statements such as "Pickering is wider than Glen Meyer" have been made about the data which implicitly assume the statistics, and thus the validity, of the sample (not to mention the cultural constructs), it is necessary to proceed with the statistical analysis of the data but the statistical cautionary note should always be born in mind. Besides proceeding in data analysis in an orderly fashion is much preferable to sweeping statements based on intuition which tend to be largely argument by assertion. Secondly, one of the things drummed into the author during a statistics course was that the

terminology of the statistics profession was in some cases highly misleading (see Wonnacott and Wonnacott 1990: 291). The primary example used was that of statistical significance. Unless one is proceeding from the black art of postmodernism, this term has a purely mathematical definition and means nothing more than the differences between these two populations was not due to sampling error at a certain level of confidence (usually 95%). "Statistical significance" should never be confused with social significance. While the observed differences may be statistically significant, the importance of the differences might not amount to more than a hill of corn during Early Ontario Iroquoian times. They could very well be absolutely meaningless from the social aspect. Further, statistically significant at the 95% confidence level means that the real value of the population lies in the established range nineteen times out of twenty or put another way the probability that the real value is in the established range is 0.95 (which suggests another problem with most archaeological uses of radio-carbon dates which normally have published ranges to one standard deviation from the mean of the sample. In effect what this means is that in any given bunch of radio-carbon dates the real date of the sample lies outside the published range in one out of every three cases). In general use 95% is deemed an acceptable error rate to establish statistical significance.

THE DATA

Settlement patterns are important to the understanding of social organization and levels of sociocultural integration. Indeed, Wright (1992:4) himself notes that, of the three primary aspects that indicate conquest, "if any one aspect of these culture systems is to be given preference, it should be settlement systems." While a broader consideration of settlement patterns would be possible (e.g. Trigger, 1968, uses a triparte model composed of regional distribution patterns, village configuration and house configuration), the analysis in this paper will confine itself to house dimension data since that was the corner stone of Wright's (1992) analysis.

Data on house structure were recorded for the following sites: Boys (Reid 1975), Bennett (Wright and Anderson 1968), Miller (Kenyon 1968), De Waele (Fox 1976), Porteous (Noble and Kenyon 1972, Stothers 1976), Van Besien (Noble 1975a), Calvert (Timmins 1997), Uren (M. Wright 1986), Reid (M. Wright 1978), Tara and Ireland (Bursey 1994, Fecteau et al 1994, Finlayson 1998), Elliot (Fox 1986a, 1986b), Berkmortel, Kelly and Yaworski, (Williamson, 1986), Nodwell (Wright, 1974), Wilcox Lake (Austin 1994), Anderson (Bursey 1996), Myers Road (Williamson 1998), Norton (Cooper and Robertson 1993), Wilcox (Poulton 1985), Slack-Caswell (Jamieson 1986), Barrie (Sutton 1999), Praying Mantis and TGIF (Robert Pearce, personal communication) and a large number of sites from the Crawford Lake area (Finlayson 1998)

The following attributes were recorded for these data:

1. Culture. This is taken as the classical assignment to either branch or MOI substages as opposed to more recent arguments, for example Bursey's (1997) paper that would reassign Bennet to the Uren Substage or classify Tara and Ireland as Glen Meyer;
2. Cluster. The geographic cluster of sites. Only four are used, London including Caradoc, Byron and Dorchester, the Norfolk Sand Plain, Crawford lake and Duffins Creek. Other sites

are included as far as culture is concerned but are not identified as to cluster since they tend to be isolated entities as far as having other nearby samples is concerned;
3. Site name;
4. House number. From the report wherever possible;
5. Maximum width;
6. Length. This measurement is generally taken as the maximum length with extensions except for the Meyers Road Site (Williamson 1998) where overlapping houses from Uren and Middleport times are inferred.

Where data for the length was not available, this category is left blank. This absence occurs primarily where the entire house has not been excavated making the overall length unknown but also where the ends were not distinct. It is recognized that there are different types of sites in the Iroquoian sequence such as village, satellite, hamlet, cabin, etc. Some of the smaller sites have been included in this analysis to increase sample size, however, it should be recognized that houses on speciality sites could be different than the associated village sites. As far as width is concerned, there is no indication that there is any variation in the width which relates to house or site function. In general if you have something recognizable as a long house the widths seem to similar regardless of the site or house function so the inclusion of houses for purposes of increasing the sample with respect to width is felt to be legitimate.

Data on house lengths and widths were subjected to several analyses using SPSS with the following procedures run. A scatter plot showing length and width by culture and by cluster was run but these were discarded as being too jumbled and of little visual value.

1. Run explore on width by culture - Key values in Table 1;
2. Run explore on width by cluster - Key values in Table 2;
3. Calculate means by culture within Cluster - Values in Table 3;
4. Run explore on length by culture - Key Values in Table 4;
5. Run Independent samples T-test on width to determine if the differences are significant between the longhouse samples assigned to various constructs. The results of these tests are summarized in Table 5;
6. Run mean by sites - three sites were selected as relevant to the discussion and are included in Table 6;
7. Run error bar on width by culture - Figure 1;
8. Run error bar on width by cluster - Figure 2.

The SPSS output file from this analysis is available on the London Chapter web site with the data as outlined below.

Table 1: Width by Culture

	Glen Meyer	Pickering	Uren	Middleport
n	51	36	31	51
mean width	6.35	7.02	6.63	7.05
std deviation	.7724	.7088	.7207	.6854
95% conf int	6.13-6.57	6.78-7.26	6.36-6.89	6.86-7.24

Table 2: Width by Cluster

	London	Norfolk	Crawford	Duffin
n	29	38	53	8
mean width	6.05	6.64	6.98	7.49
std deviation	.7784	.6582	.5625	1.0059
95% conf int	5.75-6.34	6.42-6.85	6.82-7.13	6.64-8.33

Table 3: Width by Culture within Cluster

	London	Norfolk	Crawford
EOI - n	20	27	23
EOI - mean	5.92	6.66	6.88
Uren - n	1	11	2
Uren - mean	7.0	6.59	6.6
Middleport - n	8	-	23
Middleport - mean	6.24	-	7.12

Table 4: Length by Culture

	Glen Meyer	Pickering	Uren	Middleport
n	44	33	21	34
mean width	13.34	17.25	29.77	35.99
std deviation	4.9941	9.45	14.6591	17.1713
95% conf int	11.82-14.86	13.91-20.61	23.1-36.44	30-41.98

OBSERVATIONS

Looking at the length and width data using the traditional classifications from the Ontario Iroquois Tradition (Wright 1966), several observations can be made.

1. Wright's observation that Glen Meyer houses are narrower than Pickering houses is correct and statistically significant (Table 1, Table 5, row 1);
2. Uren houses are wider than Glen Meyer house although not by much and not with statistical significance. The probability that the differences are just sampling is 0.105 which means there is nine chances in ten that the difference in the widths is real (Table 1, Table 5 row 2)
3. Uren houses are narrower than Pickering houses with statistical significance (Table 1, Table 5, row 3);
4. Middleport houses are wider than Uren and Glen Meyer houses with statistical significance but can not be distinguished from Pickering houses (Table 1, Table 5 rows 7 through 9);
5. There is a statistically significant difference between Glen Meyer and Pickering with respect to house length (Table 3);
6. Middle Ontario Iroquois houses are much longer than the early period irrespective of branch classifications although one hardly needs statistics to make this point;

If houses are examined by site cluster and cultural affiliation is ignored, the following observations are evident:

1. The width of the London cluster houses is significantly different from Norfolk houses (Table 2, Table 6, row 4);
2. The width of the Norfolk houses is significantly different than Crawford houses (Table 2, Table 6, row 5);
3. While the average house width of Duffins Creek is wider than that of Crawford Lake, it is not statistically significant. The small sample size from Duffins Creek is playing a role here (Table 2, Table 6, row 6);
4. The Uren site average width (6.59m, Table 3) is almost identical to the average of the earlier Glen Meyer houses at 6.66 in the Norfolk sand plain. Further. the Late Pickering sites which a conquest would place as an immediate precursor to Uren are wider and are more in line with the Crawford Lake average (Table 6);
5. Looking at all the average widths from Table 2, they increase moving from the west to east;
6. Looking at Table 3, this west to east increase holds for the early period and the Middleport Substage. It does not hold for the Uren Substage but the small sample from both London and Crawford Lake makes any comparison unlikely.

Table 5: Independent Samples T-Test of Various Pairs

	t	df	sig 2-tailed	mean diff	se of diff	95% Confidence Interval
Pickering vs Glen Meyer	4.15	79.3	.00	.67	.16	.35 to .98
Glen Meyer vs Uren	1.64	66.9	.105	.28	.17	-.0596 to .61
Pickering vs Uren	-2.24	63.2	.03	-3.9	.18	-.74 to -.038
London vs Norfolk	-3.29	54.6	.002	-.59	.18	-.95 to -.23
Norfolk vs Crawford	-2.58	71.9	.012	-.34	.13	-.6 to -.078
Crawford vs Duffin	-1.4	7.7	.198	-.51	.36	-1.36 to .33
Pickering vs Middleport	-.21	73.9	.835	.03	.15	-.33 to .27
Glen Meyer vs Middleport	-4.82	98.6	.000	-.69	.14	-.98 to -.41
Uren vs Middleport	-2.6	60.98	.011	-.42	.16	-.74 to -.098

Table 6: Selected Site Averages

Bennett	7	6.83
Gunby	8	7.34
Uren	11	6.59

DISCUSSION

Seemingly supportive of Wright's (1992) argument, is the demonstration that there is a statistically significant difference in both length and width between Glen Meyer and Pickering houses. Note thought that saying this assumes the validity of the Pickering and Glen Meyer constructs. This conclusion was initially a surprise in that it was expected that sampling error would negate the difference. Further, while the differences between Uren Substage sites and Glen Meyer Branch sites are not significant at the commonly accepted 95% confidence level, they would be significant at a 90% confidence level, thus also seeming to support Wright's conquest hypothesis. However,

pursuing the comparison of widths by culture further also leads to some contradictory conclusions in that Uren Substage sites are narrower than Pickering Branch sites with statistical significance and also Uren Substage sites are significantly different from Middleport Substage sites. Following this logic it could be concluded that an intrusive population of Uren Substage people conquered both the Glen Meyer and Pickering people and were subsequently conquered by the Middleport Substage people, hardly acceptable conclusions. Figure 1 illustrates the 95% confidence interval of the differences in longhouse width by culture.

However, analysis of the same data by cluster and culture within cluster shows some interesting patterns. As one moves from west to east the average width within each cluster increases and the differences between the three westerly clusters are statistically significant thus demonstrating a clinal variation. Further, the average width of the houses of the Uren site itself fits quite nicely within the range for the nearby Glen Meyer sites and is different from the Late Pickering sites (Bennett which is the cornerstone of Wright's conquest proof but also see Gunby), thus denying the Pickering origin of the Uren site as far as house width is concerned. The Late Pickering sites do fit quite nicely with other sites in the Crawford lake cluster. The west to east clinal variation seems to hold true in most cases with the possible exception of the Wilcox Lake site which has narrower widths than most of the Pickering houses. It should be noted, though, that there was significant expansion and migration going on at this time and that there are no Pickering sites in the immediate vicinity so it is difficult to tie this site to it's immediate predecessors.

In order to counter the argument that looking at the average of sites in a cluster is just as inaccurate as looking at the average by culture, Table 3 looks at the average of sites by culture within cluster and here the increasing average from west to east is evident in all of the various time periods excepting the Uren Substage where samples are too small within the London and Crawford Lake clusters. Figure 2 shows the 95% confidence intervals of the varying widths within each cluster. Note that the letters "a" and "b" were added in front of London and Norfolk respectively so that the clusters would be in order from west to east. The increasing width is clearly evident in this figure.

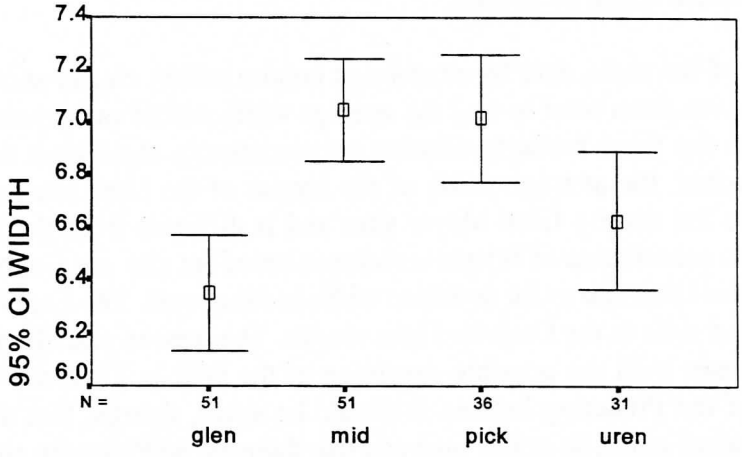
The meaning of this clinal pattern in house width is difficult to determine from the existing data. Clearly it does not seem to be simply related to house length since house lengths double going into the middle stage while widths remain similar within each cluster. Also, the fact that each cluster tends to have a preferred width regardless of length also argues against this interpretation.. There could be an environmental factor involved which might derive from either the nature of the available building material or possibly some design advantage of wider houses and winter heating.

Another possibility is that the house widths have no real meaning and are simply the result of the mental template of each group as to how wide a house should be. However, this does not explain the clinal variation since there is no reason that mental templates should align in increasing order across the province.

Figure 1:

Width by Culture

95% Confidence Interval

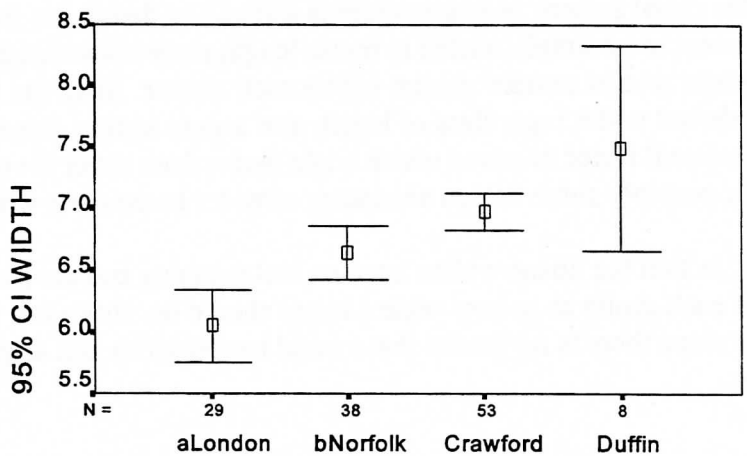


CULTURE

Figure 2:

Width by Cluster

95% Confidence Interval



CLUSTER

In light of the demonstrable increase in house width from west to east, the fact that Pickering houses are significantly wider than Glen Meyer houses becomes clear given the distribution of the two branches, Pickering is located east of Glen Meyer. Indeed, if house width differences between Glen Meyer and Pickering Substages can be taken as indicative of cultural differentiation, then the same can be said for the clusters. By that argument and given the significant differences between clusters, each cluster is a distinct political entity and we arrive at the Peer-Polity model proposed by Williamson and Robertson (1994) by following Wright's argument to it's logical conclusion.

CONCLUSIONS

In his 1992 paper Wright defined a three part argument focusing on burial patterns, settlement patterns and technology, in order to demonstrate that the total cultural system was involved in the Uren replacement of Glen Meyer which must be proven to show that the conquest had happened. In considering the settlement pattern argument the only data with which Wright dealt was the widths of the long houses. Refining that analysis with the inclusion statistical procedures and a larger sample size than was available ten years ago shows that analyzing width by culture, while initially confirming Wright's observation that the two early branches are different, also leads to some logical contradictions such as Uren is different than Middleport. Further, looking at the sites Wright used to demonstrate the conquest, the Uren site is more similar to the local Glen Meyer sequence and dissimilar to the Late Pickering sites to the east. An alternate explanation involving clinal variation with increasing width moving from west to east is a more parsimonious explanation of the data. The remaining thrust of Wright's (1992) argument, technology, will require much first hand observation of the original artefacts and careful analysis of the sampling biases present in each site sample. Variability in terms of differing classification schemes, inter-observer error, attribute analysis and type analysis in the published literature make use of comparative data from these sources problematic. Lennox and Kenyon (1984) provide an excellent discussion of these problems.

So what would it take to demonstrate a conquest and how should this problem be approached? We need to switch from the top down methodology which assumes the validity of the branch constructs (for example, Bursey 1997) and approach the issue from the bottom up. The starting point should be regional sequences and, when these are well defined and ordered chronologically through a ceramic seriation of the regional sequence as a discrete entity and a good set of anchoring points in terms of radiocarbon dates, we can proceed to comparison with other regional sequences to understand the degree of changes and timing across the Early to Middle Ontario Iroquois transition. If a conquest took place there should be an abrupt change (or a much greater change) in south-western Ontario than the Pickering homeland. We are approaching the point now where several of these sequences are beginning to be well understood for example Caradoc/Byron/Oxbow, Uren, Crawford Lake and Duffins Creek. Pearce (1996) has done this for Caradoc and Oxbow but the results are problematic since one or two sites from the Uren Substage seem to be missing from the critical point of the transition. Alternatively, the Uren sites might not be present at all because the conquest did not complete until post Uren times. Another interesting point of focus could be the Dorchester cluster since there is a large Uren site there, the Dorchester Village site (Keron 2000) which is currently only known through limited surface collection. Given Timmins (1997) detailed

analysis of the nearby late Glen Meyer Calvert site, artefact samples, settlement pattern data and a series of radiocarbon dates from the Dorchester Village site would be highly interesting. However, as argued earlier, focusing on two sites can lead to erroneous conclusion. It would be better to locate and research a larger part of the Dorchester cluster in a manner such as Finlayson (1998) has done for Crawford Lake.

Another interesting approach would be a detailed study of projectile point styles and variability across these regional clusters. As it is generally assumed that projectile points are male oriented artefacts, it should be possible to show a clean break in the Glen Meyer sequence if there is a conquest. Certainly the notched triangular projectile point appears first on Uren sites in the London area. Indeed, the Middleport Notched type could conceivably be a "war point". Ellis (1997) has shown numerous ethnographic situations where different point types were used for hunting and warfare. The Ontario Iroquois Tradition has been an useful construct for ordering data regarding the prehistory of Iroquoian people in Ontario for the last thirty years. The terminology within it, such as "Pickering" and "Glen Meyer", should and will continue to be used for general categorizations (e.g. Williamson 1990), however, we are approaching the point were sufficient evidence is available that would suggest that the equation of Pickering or Glen Meyer as a political or tribal entity is highly questionable and further has never been demonstrated but only assumed a priori. While I would disagree with those who hold that these terms obscure the reality of early Iroquoian society (surely we are capable of a comprehending multiple analytic and terminological perspectives), we need to recognize implicit assumptions in these terms and move to a comparative process between regional clusters to effectively prove or disprove these constructs. The challenge should go to those who would continue to use these terms as indicative of a political entity to demonstrate the reality of the construct and the political will requisite to a conquest. Wright's 1992 reassessment falls short of this.

Post Script

In the interest of Wright's challenge to deal with the data, the SPSS file used in this analysis is available for download from the London Chapter web site at:

http://www.ssc.uwo.ca/assoc/oas/misc/toolmenu.html.

If you have relevant data please pass it on to us and it will be included. Email addresses can be obtained from the web site.

Acknowledgements

Mike Spence, Pete Timmins, Chris Ellis, and Christine Dodd provided helpful comments on draft versions of this paper. The author assumes sole responsibility of errors or omissions.

REFERENCES CITED

Austin, Shaun J.

1994 The Wilcox Lake Site (AlGu-17): Middle Iroquoian Exploitation of the oak Ridges Moraine. *Ontario Archaeology* 58: 49-84

Bursey, J.A

1994 The Pottery from the Tara & Ireland Sites: Three Terminal Glen Meyer Components in the Burlington/Crawford lake Area. *Kewa* 94-3:2-15

1996 The Anderson Site (AfGx-54) and the Early And Middle Ontario Iroquoian Occupations of the Lower Grand River. *Kewa* 96-7: 2-20.

1997 Lessons from Burlington: A Re-consideration of the Pickering vs. Glen Meyer Debate. *Northeast Anthropology,* 53:23-46

Cooper , Martin S and David A. Robertson

1993 The Norton Site (AfHh-86): The rediscovery of a Late Iroquoian Village in London, Ontario. *Ontario Archaeology,* 56: 33-62

Dincauze, D.F. and R.J. Hasenstab

1989 Explaining the Iroquois: Tribalization on a Prehistoric Periphery. In *Centre and Periphery: Comparative Studies in Archaeology,* edited by T.C. Champion, pp 67-87, Unwin Hyman, London.

Dodd, Christine F.

1984 *Ontario Iroquois Tradition Longhouses*. National Museum of Man, Mercury Series, Paper 124:181-437. Archaeological Survey of Canada, Ottawa.

Dodd, C. F., D.R. Poulton, P.A. Lennox, D.G. Smith and G.A. Warrick

1990 The Middle Ontario Iroquoian Stage. In *The Archaeology of Southern Ontario to A.D 1650,* edited by C.J. Ellis and N. Ferris, pp 493-503. Occasional Publication of the London Chapter, Ontario Archaeological Society 5. London, Ontario

Ellis, C. J.

1997 Factors Influencing the Use of Stone Projectile Tips: An Ethnographic Perspective. In *Projectile Technology*, edited by Heidi Knecht, pp. 37-74. Plenum Press, New York.

Fecteau, Rudy, James Molnar and Gary Warrick

1994 Iroquoian Village Ecology. *Kewa* 94-8:2-16

Finlayson, Wm D., Mel Brown and Charles Turton

1989 "A Sentimental Journey" Twenty Years of Archaeological Research in the Crawford Lake Area. In *The Palisade Post.* 10(4): 1-8. Museum of Indian Archaeology, an affiliate of the University of Western Ontario.

Finlayson, Wm D.
1998 *Iroquoian Peoples of the Land of Rocks and water, AD 1000-1650: A Study in Settlement Archaeology. Volume II.* The London Museum of Archaeology, Special Publication 1. London Ontario.

Fox, William A.
1976 The Central North Shore. In *The Late Prehistory of the Lake Erie Drainage Basin.* Edited by David S. Brose pp 162-192. Scientific Publications of the Cleveland Museum of Natural History, Cleveland.
1986a The Elliot Villages (AfHc-2) - An Introduction. *Kewa* 86(1) 11-17
1986b The Breaks on the Elliot Site *Kewa* 86(2) 28-29.

Jamieson, J. Bruce
1990 The Archaeology of the St Lawrence Iroquoians. In *The Archaeology of Southern Ontario to A.D 1650,* edited by C.J. Ellis and N. Ferris, pp 385-404. Occasional Publication of the London Chapter, Ontario Archaeological Society 5. London, Ontario.

Jamieson, Susan
1986 Late Middleport Catchment Areas and the Slack-Caswell Example. *Ontario Archaeology*: 45: 27-38.
1991 A Pickering Conquest. *Kewa* 91(5): 2-18
1992 Regional Interaction and Ontario Iroquois Evolution. *Canadian Journal of Archaeology.* 16: 70-88

Kapches, Mima
1982 Pickering: Perspective and Prospective. Paper Presented at the 8th Annual Symposium at McMaster University, Hamilton.
1994 Chaos Theory and Social movements: A Theoretical View of the Formation of the Northern Iroquoian Longhouse Cultural Pattern. In *Origins of the People of the Longhouse: Proceedings of the 21st Annual Symposium of the Ontario Archaeological Society.* Edited by Andre Bekerman and Gary Warrick. Ontario Archaeological Society Toronto.

Kenyon, Walter A.
1968 *The Miller Site.* Royal Ontario Museum Occasional Paper 14. Royal Ontario Museum, Toronto

Keron, James R.
2000 The Dorchester Village Site: A Large uren Substage Village in Eastern Middlesex County. *Kewa* 00-1/2: 1-27.

Lennox, Paul and Ian Kenyon
1984 Was that Middleport Necked or Pound Oblique? A Study in Iroquoian Ceramic

Typology. *Ontario Archaeology* 42: 13-29

MacNeish, Richard S.
1952 *Iroquois Pottery Types: A Technique for the Study of Iroquois Prehistory.* National Museum of Canada Bulletin 124. Department of Resources and Development, Ottawa.

Noble, William C.
1975a Van Besien (AfHd-2): A Study in Glen Meyer Development. *Ontario Archaeology* 24(3-95).
1975b Corn and Villages in Southern Ontario. *Ontario Archaeology* 25: 37-48

Noble, William C. and Ian Kenyon
1972 Porteous (AgHb-1): A Probable Early Glen Meyer Village in Brant County. *Ontario Archaeology* 19:11-38

Pearce, Robert
1996 *Mapping Middleport: A Case Study in Societal Archaeology.* Research Report No 25, London Museum of Archaeology, London, Ontario

Poulton, Dana,
1985 Salvage Archaeology in London: The 1983-1984 C.O.E.D Program and the Magrath, Willcock and Pond Mills Site. Unpublished Report on file at D.R. Poulton & Associates Inc. London, Ontario.

Reid, C. S.
1975 *The Boys Site and the Early Ontario Iroquois Tradition.* National Museum of Man, Archaeological Survey of Canada, Mercury Series No. 42.

Smith, David G.
1990 Iroquoian Societies in Southern Ontario: Introduction and Overview. In *The Archaeology of Southern Ontario to A.D 1650,* edited by C.J. Ellis and N. Ferris, pp 493-503. occasional Publication of the London Chapter, Ontario Archaeological Society 5. London, Ontario

Spence, Michael W.
1994 Mortuary Programmes of he Early Ontario Iroquoians. *Ontario Archaeology* 58: 3-20

Stothers, David
1976 The Princess Point Complex: a Regional Representative of an Early Late Woodland Horizon in the Great Lakes Area. In *The Late Prehistory of the Lake Erie Drainage Basin.* Edited by David S. Brose pp 137-161. Scientific Publications of the Cleveland Museum of Natural History, Cleveland.

Sutherland, Geoffrey E.
1980 The Transition Between the Early and Middle Iroquois Stages. *Arch Notes* 80-6: 13-37

Sutton, Richard E.
1999 The Barrie Site: A Pioneering Iroquoian Village Located in Simcoe County, Ontario. *Ontario Archaeology* 67: 40-86.

Timmins, Peter A.
1985 *The Analysis and Interpretation of Radiocarbon Dates in Iroquoian Archaeology.* Research Report No. 19, Museum of Indian Archaeology, London, Ont.
1997 *An Interpretive Framework for the Early Iroquoian Village.* Mercury Series: Archaeological Survey of Canada, Paper 156. Canadian Museum of Civilization, Ottawa.

Trigger, Bruce G.
1968 The determinants of Settlement Patterns. In *Settlement Archaeology. K. C. Chang* , editor pp 53-78. National Press, Palo Alto, California.
1985 *Natives and Newcomers: Canada*'s *"Heroic Age" Reconsidered.* McGill-Queens University Press, Montreal and Kingston.

Tuck, James A.
1971 *Onondaga Iroquois Prehistory.* Syracuse University Press, Syracuse, New York.

White, Marian E.
1971 Review of "The Bennett Site" in *American Antiquity* 36:222-223

Williamson, Ronald F.
1985 *Glen Meyer*: *People in Transition.* Unpublished PhD Thesis, McGill University, Montreal , Quebec.
1986 The Mill Stream Cluster: The Other Side of the Coin. In *Studies In South-western Ontario Archaeology,* edited by Wm. A. Fox, pp 25-31, Occasional Publications of the London Chapter, OAS, London Ontario.
1990 The Early Iroquoian Period of Southern Ontario. In *The Archaeology of Southern Ontario to A.D 1650,* edited by C.J. Ellis and N. Ferris, pp 291-320. Occasional Publication of the London Chapter, Ontario Archaeological Society 5. London, Ontario
1998 *The Myers Road Site: Archaeology of the Early to Middle Ontarion Iroquoian Transition.* Occasional Publications of the London Chapter of the Ontario Archaeological Society No 7. London Ontario.

Williamson, Ronald F. and David A. Robertson
1994 Peer Polities Beyond the Periphery: Early and Middle Iroquoian Regional Interaction. *Ontario Archaeology 58: 27-44*

Wonnacott, Thomas H, and Ronald J. Wonnacott
1990 *Introductory Statistics for Business and Economics*. John Wiley and Sons, New York.

Wright, James V.
1966 *The Ontario Iroquois Tradition,* National Museum of Canada Bulletin 210. National Museums of Canada, Ottawa
1974 *The Nodwell Site*. National Museum of Man, Archaeological Survey of Canada, Mercury Series No. 22. Ottawa.
1982 Discussion, The Ontario Iroquois Tradition Revisited. McMaster University Anthropology Society Annual Symposium, Hamilton, Ontario.
1990 Archaeology of Southern Ontario: A Critique. In *The Archaeology of Southern Ontario to A.D. 1650,* edited by C.J. Ellis and N. Ferris, pp 493-503. Occasional Publication of the London Chapter, Ontario Archaeological Society 5. London, Ontario
1992 The Conquest Theory of the Ontario Iroquois Tradition: A Reassessment. *Ontario Archaeology* 54: 3-15
1994 Comments on Spence's "Mortuary Programmes of the Early Ontario Iroquoians". *Ontario Archaeology* 58: 23-24

Wright, James V. and J. E. Anderson
1968 *The Bennett Site*. National Museum of Man Bulletin 229. National Museum of Canada, Ottawa.

Wright, M. J.
1978 Excavation at the Glen Meyer Reid Site, Long Point, Lake Erie. *Ontario Archaeology* 29: 25-32.
1986 *The Uren Site AfHd-3: An Analysis and Reappraisal of the Uren Substage Type Site.* Monographs in Ontario Archaeology 2. Ontario Archaeological Society, Toronto.